P-ISSN 2708-6453	Pakistan Languages and Humanities Review	Jan -Mar 2023, Vol. 7, No. 1
O-ISSN 2708-6461	http://doi.org/10.47205/plhr.2023(7-I)13	[133-145]

Pakistan Languages and Humanities Review
www.plhr.org.pk

RESEARCH PAPER

Impact of Inflation and FDI on Economic Growth: A Time Series: Analysis of Pakistan

Mehak*[1] Muhmmad Waqas[2]

1. M. Phil Scholar, Department of Economics, University of Sargodha, Punjab, Pakistan
2. Assistant Professor, Department of Economics, university of Sargodha, Punjab, Pakistan

***Corresponding Author** | mehaksafdar36@gmail.com

ABSTRACT

The objective of this research paper is to check the impact of inflation, exchange rate and FDI and economic development researcher used time series data from 1973 to 2020 for my project, which researcher gathered from the sources World development indicator and State Bank of Pakistan. For inflation researcher used the proxy of Consumer Price Index (CPI), and other variables remain the same. The study paper's goal is to provide answers to the following questions: What percentage of inflation is beneficial to an economy? The three factors in the study paper's subject have a favorable long-term association with the findings. This indicates that when inflation is below the 2.80 percent barrier, which is the point at which it hinders growth, the Pakistani economy expands at its fastest rate. The marginal effect of FDI on growth is found to be positive when inflation is below the threshold, but it is found to be negative when inflation is over the threshold. In conclusion, the Pakistani government must harness, develop, and stabilize the nation's macroeconomic system while ensuring that inflation stays below the threshold in order to prevent alienating foreign investors.

KEYWORDS CPI, FDI, Johnson Cointegration Test, Pakistan

Introduction

Inflation in food prices has emerged as Pakistan's primary economic obstacle. It hinders growth and reduces people's purchasing power. Rising food costs present a challenge for Pakistan, a developing nation. Since it reduces government aid to the poor, this problem needs to be addressed. Due to an unreliable economic growth rate, a balance of payments issue, rising debt obligations, and a dismal tax system that discourages foreign investors from investing in Pakistan, the country's current account and budget deficits worsen. (Mushtaq, et. al. 2017). Political Instability and the Budget Deficit in Economy: A Case of Pakistan, Pakistan Social Sciences Review, 1 (I), 01-20 It is imperative to stress foreign direct investment (FDI), which is quite important. Stipend has been a powerful engine for economic progress due to how crucial it is in supplying new ideas, goods, managerial skills, and a demanding business climate. A long-term overseeing stake of at least 10% in a foreign company is widely thought to be necessary for foreign direct investment (World Bank, 1996). A climacteric technique employed to enchant money flows from outside sources, foreign direct investment has gradually evolved into this state. Foreign direct investment has significantly sparked economic growth in third-world nations (Muhammad, 2007). In these nations, FDI helps to reduce unemployment while also enabling them to make better use of their natural and human resources (Kelvin et.al, 2019).

A developing nation receiving foreign direct investment makes it feasible to employ and use its human and natural resources, implement splitting management and marketing techniques, and reduce financial deficits. The fact that FDI involves through on-the-job training, it increases the value of human capital and reduces the risks and regulations of foreign debt. is another advantage. Because of the sluggish growth experienced by nations lacking in capital and technological expertise. Studies suggest that foreign direct investment can facilitate the transfer of knowledge and technology. (Dunning et.al, 1997)

Pakistan is a young nation with a rich past and a rapidly expanding population. The majority of her population lives in poverty, her per capita income is poor, and her economy is mostly based on agriculture. Therefore, promoting foreign direct investment and lowering inflation are macroeconomic policymakers' top priorities. Pakistan is one of the major nations in this region and the founding member of SAARC (South Asian Relationship for Local Collaboration). It is blessed with a wealth of resources, including natural resources, labor supply, agricultural innovation, and other God-given natural resources.

Literature Review

Gudaro et al. (2012), studied the performance of Pakistan's GDP (gross domestic product), the consumer price index (CPI), and FDI (foreign direct investment) and CPI (consumer price index) historical patterns. Panel data were used from 1960 to 1998. For the analysis, the CPI and GDP with FDI were used. GDP is used as the dependent variable, with FDI and CPI being assessed as independent variables. E-Views were placed through the aforementioned Multiple Regression Model to ascertain how FDI and CPI affected Pakistan's GDP. This alternate relapsing model uses Gross Domestic Product as a dependent variable even if FDI and CPI are considered as autonomous components. studied the performance of Pakistan's GDP (gross domestic product), the consumer price index (CPI), and FDI (foreign direct investment) and CPI (consumer price index) historical patterns. Panel data were used from 1960 to 1998. For the analysis, the CPI and GDP with FDI were used. The dependent variable is GDP, whereas the independent variables are FDI and CPI.

Afzalur (2015), a study was conducted to determine the impact of FDI on Bangladesh's economy. Time series data were used for a fifteen-year period, from 1999 to 2013. The relationship between the independent (FDI) and dependent variables was examined using multiple regression analysis. FDI inflow is the independent variable, whereas CPI inflation, GDP, and BOT are the dependent variables. Examining the theories and research surrounding how FDI affects economic expansion was the main goal. Statistical results of FDI showed a significant positive link with inflation rate, a significant negative correlation with the (balance of payments), and an insignificant positive correlation with GDP growth. As a result, this study's findings suggest that Bangladesh's economic expansion has not been accompanied by an increase in FDI.

Nuzhat et al. (2009), studied how FDI affected Pakistan's economic growth between 1980 and 2006. estimation of panel data from 1975 to 1995 for 71 developing countries. the theoretical framework that was used to examine the link between FDI and economic growth. The production function, which is based on the endogenous growth theory, is used to examine the relationship between FDI and economic growth. In addition, labor, domestic capital, and trade are some other elements that influence economic expansion. The independent variables are FDI and FDI, and the dependent variable is GDP. The model is based on the endogenous development idea. The report

claims that Pakistan would successfully transform the advantages of FDI inflows if the domestic financial system develops to a specific level of development. The study's conclusions are fascinating and consistent with other academics' findings that looked at the relationship between Pakistan's

Anum et al. (2018), examined how employee job satisfaction is affected by leader reward behavior and organizational injustice. Between 2000 and 2012, this study gathered data from Pakistan, India, and Sri Lanka, three South Asian countries. Foreign direct investment (FDI), domestic capital (KD), trade openness (OPT), external debt (EXD), and labor force participation rate are the independent variables. GDPGR, or the growth rate of the gross domestic product, is the dependent variable (LPR). The data were tested for stationaries using the Augmented Dickey Fuller (ADF) test, and the long-term co-integration of the variables was investigated using the Auto Regressive Distributed Lag (ARDL) model. The State Bank of Pakistan, the World Bank, and the Monetary Study of Pakistan provided the time series data from 1976 to 2015.The exploration is finished through unmistakable examination where different applicable genuine articles, reports and exploration papers are contemplated. The findings indicate that employee training programs make use of information technology systems. Employee training, the development of skills related to the job, enhanced knowledge, and enhanced competencies all benefit from these programs.

Hussain et al. (2014), studied the considerable and positive link between worker remittances and GDP growth, as well as their contribution to the Pakistani economy. Like trade openness and global GDP growth, the financial sector has a favorable and considerable impact on GDP expansion. Settlements in Pakistan are a dependable variable, and Pakistan's and the world's Gross Domestic Product is the independent variable. This study utilized two types of data: first, Pakistan Survey data (HIES) from 1996–1997 and 2006–2007. Also, time series information of Pakistan has been utilized from 1975 to 2009. According to the study, remittances tend to reduce poverty in Pakistan. Our results also show a positive correlation between the GDP of Pakistan and the GDP of the entire world.

Umer et al. (2013), investigated how the industrial sector's growing demand for capital equipment and raw materials, as well as its size and geographical location, make Our findings also indicate a favorable link between Pakistan's GDP and the global GDP. important for boosting growth and attracting more technological innovations and spillovers. GDP significantly and favorably influences the development of the industrial sector. In contrast, there is no significant relationship between inflation and trade openness, and all independent variables have a long-term relationship. test is a standard unit root test that looks at how the data series are integrated in order. The study found long-term equilibrium, which indicates that the variables are cointegrated, though they may still be out of equilibrium in the short term. The primary goal of this study is to determine how Pakistan's growing industrial sector has affected variables like trade openness, consumer price index, real effective exchange rate, and real GDP.

Komal et al. (2021), observed the goal was to ascertain the connection between the nation's economic development and FDI (foreign direct investment) from 1997 to 2017. The interrelationship between the variables was determined using the VAR model; and the current study's VAR estimation results are demonstrated. The fundamental economic indicators (FDI, GDP, and CPI) were used to assess relative growth using the time series method for 20 years of quarterly data (from 1997Q3 to 2017Q4). The ADF test was used to validate the stationarity of time series. and its three alternative models, which include a model without a constant or trend, a model that stays the same, and a

model that reflects both the trend and the constant. Time series research led to the conclusion that FDI inflows peaked in 2007 and 2008, started to fall, and kept down until 2016, but stabilized through 2020.

AYDIN et al. (2019), Utilized panel data analysis and data from 15 countries that are members of the European Union, investigate the connection that exists between the unemployment rate, growth rate, and inflation rate for the time period from 2008 to 2018. The short-term interest rates are the model's dependent variable. As an independent variable, the FED's unconventional monetary policy, global interest rates, the dollar rate, and gold prices have been chosen. The long-term and short-term connections between This study focuses on energy consumption, GDP, trade openness, financial development, and urbanization. According to the findings of the research, it is necessary to construct in-house OHS training based on the adult profile of the participants, utilize various training methods, implement skills training, provide feedback on the participants' development, and jointly evaluate the training's outcomes. According to the study's findings, in terms of intercultural sensitivity, gender, marital status, economic status, and job situations played no significant part.

Nasreen et al. (2014), investigated how foreign direct investment affected Pakistan's economic growth. The data was compiled from the IMF and World Bank's official websites between 1967 and 2012. Five variables, such as foreign direct investment (FDI), In order to determine the dependent variable, time series analysis was employed with the following independent variables: GDP, exports, imports, inflation, and others. GDP and exports are positively correlated with FDI, whereas imports and inflation are negatively correlated with FDI. For this purpose, we made use of the OLS method. Result proposes that the Pakistan economy is amazing. We can improve Pakistan's economy by increasing our GDP, if we keep imports under control and focus on increasing exports, as well as control inflation. The following sections of the paper are organised as follows: they cover our results, data collection, technique, and variable definition, as well as theoretical and empirical research on the connection between FDI and economic growth.

Urooj et al. (2019), Since 1992, studies on Pakistan's GDP growth rate and foreign direct investment have been conducted. The relationship between two variables was examined using regression analysis, and the independent variable's (FDI) impact on the dependent variable was measured using the coefficient of determination (GDP). As mentioned earlier, Investigating the connection between Pakistan's GDP and FDI from 1990–1991 to 2011–2012 is the goal of this article. The data have been gathered from the aforementioned trustworthy sources. Using a straightforward regression model, Examining the connection between FDI and4 GDP growth rate. The Ordinary Least Square technique reveals a favorable relationship between FDI and GDP.

Ali et al. (2019), examined the contribution of foreign direct investment (FDI) to Pakistan's people-centered economic development between 1972 and 2015. They discovered that FDI had a greatly positive effect developing nations' GDP per capita. Using time series data, SPDC (2006) empirically investigated the connections between FDI and poverty and inequality in Pakistan. Using the human development index (HDI) and its sub-indexes (dependent variables), we discovered that HDI is less affected by foreign direct investment (FDI) in developing nations. The process of economic development will also be influenced by other elements. Real gross domestic product and macroeconomic stability (inflation) are the study's control variables. This was a time series study with an explanation. The At a 5% level of significance, the results are both positive and statistically significant.) effects on the impact of foreign direct investment

a human-centered perspective of economic development over time are supported by empirical findings.

Misbah et al. (2021), examined how the long-term viability of foreign private investment (FPI) in Pakistan is influenced by taxes, technology, trade openness, economic growth, and the exchange rate. GDP is used as the independent variable's proxy (economic growth). Taxes, technology (using Imports and exports, GDP per capita, and the exchange rate are among the control and instrumental variables for this study., respectively. Random effects and generalized least squares estimators are used in this study, which uses data from 1996 to 2017. Additionally, Contributions of domestic companies to the national economy rise as a result of investment in emerging and developed economies. The results, which are comparable across models, show that although Pakistan's economy is more likely to receive FPI from developed and emerging economies, the relative intensity of local government activities is the same regardless of economic size. Additionally, FPI is more likely to be produced by industrialized countries. The findings suggest that the economy of Pakistan has had a significant impact on where and how developed and emerging nations choose to invest in the domestic market.

Amir et al. (2019), the investigation of the is the study's main goal. role that FDI played in Pakistan's people-centered view of economic development from 1972 to 2015. This study employs the actual gross domestic product (GDP) and the human development index (HDI), and inflation as proxies of economic development in accordance with the human centered view of economic development. To determine long-run (LR) associations, the Auto Regressive Distributed Lag (ARDL) bound testing method is utilized. Responsiveness investigation affirms that underlying outcomes are vigorous. FDI altogether affects HDI with pay and barring pay part. This study's findings emphasize the importance of foreign direct investment to Pakistan's development. To fulfil the aspirational objective of human development as an explicit objective of Pakistan's economic development, the research recommends that the Pakistani government adopt measures that are more favorable to FDI in conjunction with growth-enhancing and macroeconomic stability policies.

AZAM (2010), explored the impacts of various monetary determinants on unfamiliar direct venture (FDI) for three nations chosen from Focal Asia in particular Armenia, Kyrgyz Republic and Turkmenistan. The World Development Indicators secondary data for the years 1991 to 2009 (for a variety of reasons) were used. The least squares method and a straightforward econometric model in log form were utilized. The discovered result indicates that FDI is negatively impacted by inflation, while market size and official development assistance have positive effects. However, In Armenia, it was shown that there was little correlation between FDI and ODA, and inflation’s impact on FDI was found to be negligible and was predicted to be negative. in the Kyrgyz Republic. In order to increase FDI and accelerate economic development, the study's findings suggest that market size should be increased, official development assistance should be increased, and inflation should be controlled.

Anwar et al. (2014), political stability's moderating impact on Yemen's FDI flow over the past two decades is the subject of this research the stationary nature of the data was established using the augmented Dickey Fuller (ADF) test. The For the analysis following the ADF test, both conventional and hierarchical regression techniques were used. The outcomes of FDI inflows into Yemen are significantly negatively impacted by the GDP growth rate, according to the conventional model, but are unaffected by the exchange rate, inflation rate, balance of payments, or gross national income. The results

of hierarchical regression, on the other hand, indicate that considering political stability as a moderating factor well as other variables like Exchange rates, inflation rates, balance of payments, and gross national income all play a big part in determining how much foreign direct investment enters a country. nation. As a result, the findings suggest that Political stability is necessary for Yemen's economy to flourish. uses. uses time series data to investigate the effects of FDI on the Pakistani economy from 1971 to 2006. The findings demonstrate that while the account balance has a negative sign, statistically relevant determinant variables including the degree of trade openness, gross fixed capital formation, and inflation rate have positive signs.

Jilenga et al. (2016), This study used time series data from 1971 to 2011. looks at how Foreign debt and FDI have an impact on Tanzania's economic expansion. Pesaran et al.'s Bounds test method of cointegration served as the foundation for the empirical analysis. 2001) to examine the relationship's long-term equilibrium. The findings demonstrate that debt fosters economic expansion in Tanzania over the long term. However, economic expansion is hindered by direct investment from abroad. Economic growth (RGDP) and FDI INFL both external debts (PD) do not appear to be directionally correlated the results show that in the short run. The various results may be primarily attributable to the various approaches taken and particular macroeconomic variables considered for a particular nation. The previous studies that were carried out in various nations are listed below in order to provide some insight into our comprehension of this topic.

Kelvin et al. (2019), examine the connection between Ghana's economic expansion, FDI, and inflation. According to his research, a low inflation rate stabilizes the host nation internally, which in turn encourages FDI and increases its returns. His concentrate likewise pointed toward analyzing FDI's impact on Nigeria's monetary development rate. In the study, they used data from 1980 to 2009 that were time series. Last but not least, the outcome also suggests a relationship between the variables over the long term, making it possible to estimate the long-run model. With a constant savings rate of endogenous growth in its special case The AK model is a Cobb-Douglas production function is the easiest endogenous model to use here. Real GDP serves as a proxy for economic expansion. Macroeconomic stability is measured by exchange rates, lending interest rates, and gross capital formation, while internal shocks are measured by government spending on goods and services, production of new capital, and the total money supply. According to our findings, economic growth is negatively correlated with only inflation, the interactive term, and the broad money supply—and only money supply is statistically significant.

ANTWI et al. (2013), explored financial development as an expansion in genuine total national output (domestically produced goods). Specifically, the GDP adjusted for inflation. But the actual GDP per capita used in this study is used to gauge economic expansion. This is due to the fact that Gyimah-Brempong (1989) used a simultaneous-equations model to ascertain how military spending affects Sub-Saharan African economic development nations. He concluded that spending money on the military stifled economic expansion. Between the years 1980 and 2010, the study was conducted. The time series of the data was initially examined using the Augmented Dickey Fuller (ADF) test. properties. After their initial differencing, the derived Empirical findings show that all of the relevant variables were stationary. The study found a cointegration relationship between its macroeconomic factors and real GDP per capita (economic growth). Instead than relying on foreign aid, the government should be able to create more home revenue, among other policy recommendations.

Faten examines the main goal of this research is to determine the relationship between economic growth, inflation, global commerce, and foreign direct investment. International trade, foreign direct investment, and inflation are all independent variables. The dependent variable is the gross domestic product. The equipment utilized in the data for independent and dependent variables in a multilinear regression. From 1983 to 2012, data were collected in Malaysia for 30 years. the cross-sectional and time series data to run and analyze this study's findings. The variables that are significant are only used in the Multiple Regression model. According to empirical findings, there is no association between economic expansion and inflation. Due to the general rise in the cost of goods, economic expansion will not have any effect on inflation. Additionally, while FDI has a positive correlation with economic expansion, Balance of Trade (BOT) has a negative one.

Material and Methods

In order to look into the relationship between FDI and the economy of Pakistan, we will make use of time series data and develop an econometric model. We will create a model to guarantee this in order to determine how these factors exactly relate to one another, Pakistani annual time series data from 1980 to 2020 were used in the study. Collected from World development indicator and state bank of Pakistan. Following variables are used in this study, GDP as taken Exchange Rate, inflation (a substitute for CPI), and FDI are all employed as independent variables. Further, this study will also investigate the link between dependent and independent variables across the short and long terms by applying Johnson & ARDL cointegration test. On the basis of the above discussion the following econometric model has developed for our analysis.

Variable Description

Table 1

Variables	Description	Definition	Source
GDP	GDP is measure on the annual % ratio	GDP measure the monetary worth of finished products and services—those imported by consumers—that were created in a nation over a specific time period (such as a quarter or a year).	WDI
FDI	FDI (net inflow of the country) is measured on the GDP ratio.	Foreign direct investment (FDI) is defined as an investment involving a long-term relationship and indicating a permanent interest and control by a resident entity in one economy (foreign direct investor or parent firm) in an enterprise residing in another economy. economy other than that of the foreign direct investor	WDI
Inflation	Inflation rate is measure on the consumer price index (CPI) basis.	In the field of economics, inflation refers to a general increase in an economy's price level over time (or, less frequently, price inflation).	WDI
Exchange Rate	Exchange Rate % of GDP	the value of one currency for the purpose of conversion to another.	WDI

Model Specification

$$GDP = \alpha 0 + \beta 1 FDI + \beta 2 EXR + \beta 3 INFL + \mu \ldots$$

Where:

GDP = Gross Domestic Product (GDP) is a proxy for economic growth.

FDI = Foreign Direct Investment (FDI)

EXR = The average nominal exchange rate (EXR)

INFL = Inflation rates (INFL)

There α and β's is referring to the parameters and it further divided into constant and intercept. So $\beta 1, \beta 2$, and $\beta 3$ are coefficient of FDI, EXR and INFL.

Descriptive Statistics

Table 2

	GDPG	FDI	EXR	INFL
Mean	4.698537	0.897317	56.54349	8.163171
Median	4.850000	0.670000	53.64819	7.840000
Maximum	10.22000	3.670000	161.8385	20.29000
Minimum	-0.940000	0.100000	9.900000	2.530000
Std. Dev.	2.250208	0.782605	39.61084	3.763351
Skewness	-0.136209	2.260623	0.800630	0.676587
Kurtosis	3.064236	7.770656	2.936542	3.772466
Jarque-Bera	0.133828	73.80141	4.387098	4.147460
Probability	0.935276	0.000000	0.111520	0.125716

The descriptive statistics are also calculated in this research study for virtually all of the desired variables in which it is discovered that means. All of our variables have positive means. Similarly, the variance in this data is depicted using standard deviation. Thus, the standard deviation in the statistics of GDPG, FDI, EXR and INFL 2.250208, 0.782623, 39,61084 and 3,763351 respectively. As a result, the value of Jarque-Bera statistics indicates whether or not our variables are normally distributed. Except for the FDI variable, all of our variables are normally distributed. The value of CYTR is 0.0000, which is less than the 5% threshold (0.05). Furthermore, the Jarque-Bera Prob. Value for all other variables is larger than 0.05.

Correlation

Table 3

	FDI	EXR	INFL
FDI	1		
EXR	0.180713843150518	1	
INFL	0.3669760022058506	-0.0244647779344121	1

The correlation matrix is shown in Table 3 FDI and EXR have a direct relationship. The FDI and INFL also positive association. But the EXR and INFL indirect relationship.

Lag-Order Selection Criteria

Table 4

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-398.7052	NA	33402.80	21.76785	21.94200	21.82925
1	-279.0879	206.9056	124.2208	16.16691	17.03768*	16.47390
2	-255.9476	35.02317*	87.29084*	15.78095*	17.34833	16.33353*
3	-241.2774	19.03165	102.1446	15.85283	18.11682	16.65100
4	-230.4742	11.67908	160.7042	16.13374	19.09435	17.17749

Before completing the VAR model, the accuracy level should be tested by computing the lag value, which is commonly expressed by the p-value. In the conducted study, it was necessary to apply Akeake's Information Criterion (AIC) and other calculations for some k independent variables in order to assess the feasibility level of climatic change on cocoa bean yield, where the AIC value is generally defined using the following mathematical equation (Schumway et al., 2011). Therefore, Table 4.3 show the procedure of proper lag length criteria. Mostly, studies employed AIC and SC criteria. According to rule of thumb, AIC is appropriate for selection, which holds the lowest value. In this study also employed AIC criteria. The lowest value of AIC is 15.78095* which is existing under lag 2.

Unit root test

Table 5

Variables	**Level**				**1st difference**			
	T-test	C.V5%	P-value	Result	T-test	C.V5%	P-value	Result
GDP	-4.8114	-2.97185	0.0071	I (0)	-	-	-	-
FDI	-4.9401	-3.5806	0.0024	I (0)	-	-	-	-
EXR	-5.1168	-3.5806	0.0000	I (0)	-	-	-	-
INFL	0.0950	-0.5133	0.6137	I (0)	0.0811	-3.9546	0.0008	I (1)

Table displays the results of the unit root Augmented Dickey Fuller test. Each variable, including the rate of GDP growth, FDI, inflation, and exchange rate, is evaluated using ADF when both are stationary at the initial difference. All of the study's variables are integrated in the I (0) and I mixed order (1). So, we employed the ARDL model. The initial phase of time series data analysis is known as the unit root test, sometimes known as the non-stationarity problem. Time series may yield erroneous regression findings due to the non-stationarity of the variables. To establish whether or not a time series is stationary, unit root tests are performed. If a time series' mean, variance, or both are constant, the data is considered to be stationary. We apply straightforward linear regression when all variables are cointegrated at level I (0). (Meyer and Breitung, 1994)

Bound-Test

Table 6

HEXP = β_0 + β_1GDPpc + β_2EMP + β_3EDUEXP + β_4TRADE + e

ARDL (2, 0, 0, 0, 0)

	F-statistic (5.148743)	
Critical Values	I0 Bound	I1 Bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

Using two limits, the lower bound and the upper bound, the F-Statistics performs a bound test to ascertain the long run link as illustrated in equation (3.1). According to the null hypothesis, there is no cointegration of the variables. The null hypothesis is rejected if the F-Statistics values are greater than the upper bound; if they are lower than the lower boundaries, no cointegration is found (Narayan, 2005). When F-statistics are >I0 and I1, they indicate that cointegration is present and that the null hypothesis should be rejected.

Long Run Coefficient

Table 7

Dependent variable: GDPG
Selected ARDL Model (2, 0, 0, 0, 0)
Sample: 1980 2020

Variable	Coefficient	Std. Error	t-Statistic (Prob.)
FDI	0.054484	0.568490	0.095840 (0.9242)
EXR	-0.029710	0.010446	-2.844181(0.0074)
INFL	-0.277392	0.124595	-2.226345(0.0325)
C	8.300551	1.179930	7.034784(0.0000)

The table 4.6 shown LR-co-integration outcome. The explanatory variable of the given model entirely affects our target variable but positive and negatively. The FDI is positive while EXR and INFL negative impact on GDP growth. When FDI is increase 1-unit the GDP growth also increased 0.05%. In case of Pakistan, when FDI increases the growth of Pakistan also increase. Besides when EXR raise 1 unit the GDP growth decline 0.02%. Means FDI effects growth in case of Pakistan. Because FDI also bring conflicts among the provinces and external conflict. When INFL increase 1 unit the GDP growth reduce0.27%. These notable issues negative impact on Pakistan's FDI in the case of long-run.

short-run coefficient

Table 8

Dependent variable: HEXP
Selected ARDL Model (2, 0, 0, 0, 0)
Time Period: 1972-2021

Regressor	Coefficient	Std. Error	t-Statistic (Prob.)
D(FDI)	0.034396	0.359700	0.095623 (0.9244)
D(EXR)	-0.018756	0.007292	-2.571993 (0.0145)
D(INFL)	-0.175116	0.074344	-2.355475 (0.0242)
CointEq(-1)	-0.631295	0.136182	-4.635670 (0.0000)
R-squared	0.454529	Mean dependent var	4.698537
Adjusted R-squared	0.402194	S.D. dependent var	2.250208
S.E. of regression	1.879707	Akaike info criterion	4.192576
Sum squared resid	130.7320	Schwarz criterion	4.359754
Log likelihood	-81.94782	Hannan-Quinn criter.	4.253453
F-statistic	6.774173	Durbin-Watson stat	1.865993
Prob(F-statistic)	0.000936		

Table shows the short run outcome. In short run are statistically significant impacts on GDP growth except FDI. The ECM or ECT value is negative -0.631295 and highly statistically significant 0.0001 which indicates the short-run converge to long run. The ECT value is -0.63 (63% out of 100%) indicates half year. Therefore, prob value of F-statistics value of the entire model is 0.0009 which is <0.05 (at 5% level). The particular model is also from serial correlation because the DW value is 1.86 (which are close to 2). The R2 value is 0.45 means explanatory variables 45% effect our target value 55% others variables which not included in the model.

Diagnostic tests

Table 9

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.584332	Prob. F (4,35)	0.6760
Obs*R-squared	2.504013	Prob. Chi-Square (4)	0.6439
Scaled explained SS	2.044752	Prob. Chi-Square (4)	0.7275
Breusch-Godfrey Serial Correlation LM Test			
F-statistic	0.556667	Prob. F (2,33)	0.5784

Obs*R-squared	1.305454	Prob. Chi-Square (2)	0.5206

Table expressed the outcome of the diagnostic tests. Now, we check our model is free from diagnostic test or not. For this purpose, many tests are used but, in this study, employed BPG and BG serial correlation LM test. The BPG used to check the Heteroskedasticity. The F-statics value of Obs*R2 0.7 which >0.05 so accept H_0 and H_0 the Heteroskedasticity does not exist. There is no serial correlation in the model because the BG serial correlation LM test is 0.06 and the model is also held normality. The normality of the model describes the figure-1.

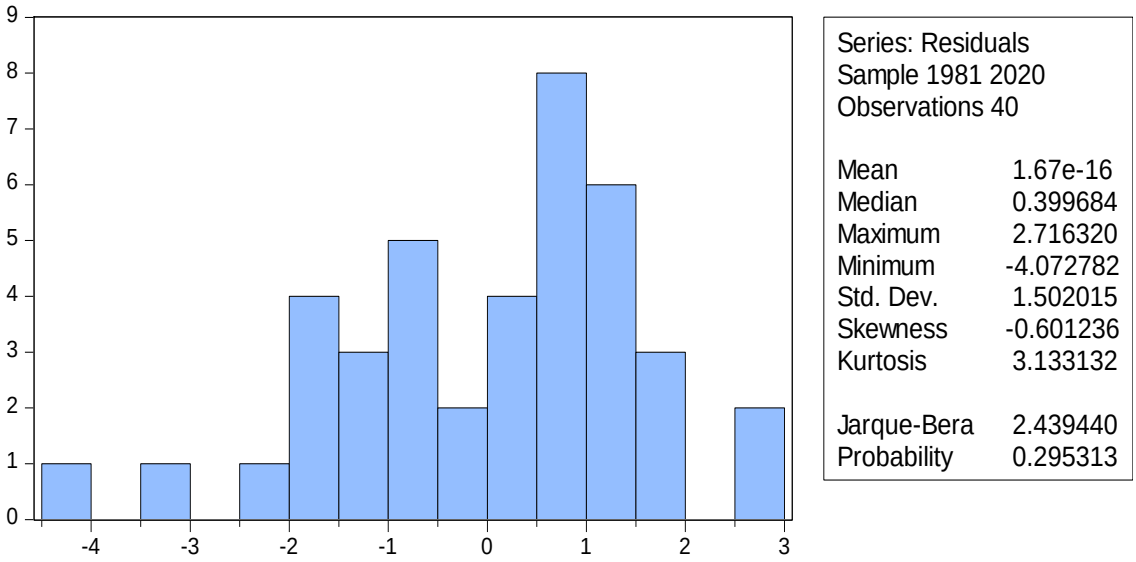

Fig .1 Diagnostic tests

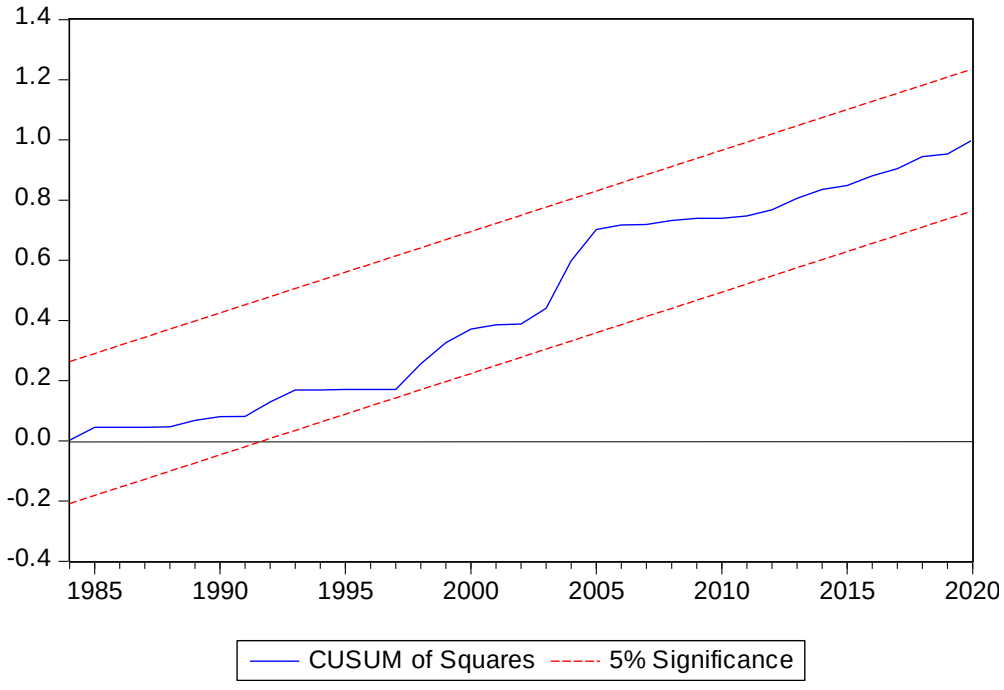

Fig .2 Cusum of Squares test

Stability Test

Brown et al. created the Cusum (cumulative sum) and Cusum of squares tests (1975). The sum of recursive residuals plot is the foundation of the Cusum test. Two parallel red lines are shown in the charts below, and a single blue line is shown inside these two red lines. The blue line crosses the redlines, rejecting the null hypothesis of stable parameters for each of the projected variables. The redlines represent 5% critical bounds. However, the null hypothesis is not refuted if the plot stays between two straight lines. While the cumulative sum of square test can reveal whether or not the coefficients of regression are changing suddenly, the cumulative sum test can show whether or not they are changing continuously.

Conclusion

In any developing nation, investments contribute significantly to the growth of resources, infrastructure, and economic growth. Direct investment indicates a positive investment trend in an economy, which eventually leads to an GDP growth and economic expansion the aforementioned studies can also be found in the literature review be used to support this. The country's economic, political, and social circumstances must be considered in all efforts in this direction. FDI needs to have an impact on the economy in order to there must be tangible benefits and opportunities for the investor. Any investment would not be able to achieve the desired outcomes without these. Here, we need to realize that the local government is in charge of coming up with policies and tactics that will support the investments and efforts being undertaken. The development of infrastructure, the development of human resources, the support of local businesspeople, the creation of a stable macroeconomic environment, the creation of chances that are advantageous to investors and provide the economy momentum development process are the urgent needs of a nation like Pakistan.

References

Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and economic growth: the role of local financial markets. *Journal of international economics*, *64*(1), 89-112.

Barro, R. J. (1995). Inflation ane Economic Growth. *NBER Working Paper*, *5326*.

Bhatti, M. I., & Al-Shanfari, H. (2017). *Econometric analysis of model selection and model testing*. Routledge

Breitung, J., & Meyer, W. (1994). Testing for unit roots in panel data: are wages on different bargaining levels cointegrated. *Applied economics*, *26*(4), 353-361.

Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for testing the constancy of regression relationships over time. *Journal of the Royal Statistical Society: Series B (Methodological)*, *37*(2), 149-163.

COBAN, O., & YUSSIF, A. R. (2019). relationships between economic growth, foreign direct investment and inflation: ARDL models approach for the case of Ghana. *Eurasian Research Journal*, *1*(2), 7-23.

Desai, M. A., Foley, C. F., & Hines Jr, J. R. (2005). Foreign direct investment and the domestic capital stock. *American Economic Review*, *95*(2), 33-38.

Fosu, A. K. (1990). Export composition and the impact of exports on economic growth of developing economies. *Economics Letters*, *34*(1), 67-71.

Ghauri, P., Grønhaug, K., & Strange, R. (2020). *Research methods in business studies*. Cambridge University Press.

Herzer, D., & Klasen, S. (2008). In search of FDI-led growth in developing countries: The way forward. *Economic Modelling*, *25*(5), 793-810.

Khan, M. A. (2007). *Foreign direct investment and economic growth: The role of domestic financial sector* (No. 2007: 18). Pakistan Institute of Development Economics.

Mushtaq, A. Q., Muzaffar, M., & Ali, A. (2017). Political Instability and the Budget Deficit in Economy: A Case of Pakistan, Pakistan Social Sciences Review, 1 (I), 01-20

Narayan, P. K. (2005). The saving and investment nexus for China: evidence from cointegration tests. *Applied economics*, *37*(17), 1979-1990.

Salman, A., & Feng, H. X. (2010). FDI in Pakistan: Impact on GNP and Capital Financial Account. 2010 International Conference on Financial Theory and Engineering. http://dx.doi.org/10.1109/ICFTE.2010. 5499389

Schumway, R. H., Stoffer, D. S. (2011), Time series analysis and its application, New York: Springer Science+Business Media, Inc., pp. 218-235.

Shabbir, T., Mahmood, A., & Niazi, S. A. (1992). The effects of foreign private investment on economic growth in Pakistan [with comments]. *The Pakistan development review*, *31*(4), 831-841.

Suleiman, D. M. (2010). "The impact of money supply on Economic Growth in Nigeria (1970-2007). European Journal of Scientific Research, 41(2), 314-322.